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ABSTRACT

A study focused on predictors of people's learning from public service announcements (PSAs) seen on television. Telephone interviews were conducted with 480 adults randomly selected from residents in Dane County, Wisconsin, in October 1987. Typical demographic information was obtained: sex, age, income, occupation and education. Commercial slogans were provided to respondents and they were asked to name products and brands corresponding to those slogans. The degrees of attention to international affairs, and to national government and politics, local government and politics, were combined into an index to measure attention to television public affairs. Five-point Likert scale items were used to measure world view. People were asked to recall as many PSAs as they could and state what the PSAs tried to tell people to do. Results indicated that exposure to television public affairs is not correlated with awareness of PSAs. The regression analysis indicated that attention to public affairs contributed significantly to awareness and comprehension of PSAs. Other media predictors did not contribute significantly to the variation of comprehension. People who believe that the world is understandable were found to pay more attention to public affairs while fatalistic people appeared to be less likely to pay attention to television public affairs. It was found that interaction between "knowable world" and attention to public affairs does not play a role in affecting learning. When testing the interaction between fatalism and attention to public affairs there was a significant relation in the positive direction. (Fourteen endnotes and 12 tables of data are included; 48 references are attached.) (MG)

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Abstract of AEJ Paper (Public Relations Division)

Predictors of Learning from Public Service Announcements

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The present study attempts to address the question about what predicts people's learning from public service announcements (PSAs). Different dimensions of the concept "television use", such as attention-specific (exposure vs. attention) and content-specific (public affairs, entertainment and advertisements) dimensions, are hypothesized to have differential effects on the acquisition of knowledge from PSAs. In addition, some literature suggests that individuals' "world view" is closely tied to their patterns of media use, and world view could indirectly affect people's learning of PSAs.

Our findings suggest that age and memory factor most strongly affect people's ability to recall and comprehend PSAs. That is, people who are relatively young with good memories (indexed by the ability of commercial recall) are more able to learn things from PSAs. Attention to television public affairs content contributes to the increase in PSA awareness but not awareness. People who believe the world is knowable and hold low fatalistic world views are likely to pay more attention to public affairs content on television, which in turn influences PSA learning.

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Predictors of Learning from Public Service Announcements

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Abstract

The present study focuses on predictors of people's learning from public service announcements (PSAs) and found that age and memory factor most strongly affect people's ability to recall and comprehend PSAs. Attention to television public affairs content contributes to the increase in PSA awareness but not comprehension. People who believe the world is knowable and hold low fatalistic world views are likely to pay more attention to public affairs content on television, which in turn influences PSA learning.

Predictors of Learning from Public Service Announcements

I. Introduction

The public service announcement (PSA) has long been considered an important vehicle in promoting voluntary individual actions to solve various social problems (Lynn, 1973). The PSA has been defined by Lynn (1974) as a "persuasive, yet highly specialized form of communication utilized to disseminate information on public issues to the masses." PSAs are used by many public relations practitioners in non-profit organizations to gain free placement and publicity about "problems assumed to be of general concern to citizens at large (O'Keefe, Mendelsohn and Liu, 1980)." The present paper will focus on predictors of learning from televised PSAs, including patterns of television use and respondents' world view. The paper will also explore the distinction between recall and comprehension of PSA messages. By carefully analyzing antecedents to people's ability to learn PSAs, we hope to provide useful suggestions to public relations practitioners and information campaign planners.

There are relatively few studies exclusively focusing on PSAs, but several have dealt with PSAs in conjunction with other communication vehicles. A classic longitudinal study on seat-belt-use campaigns serves as an example of PSA effects in the context of information campaigns (Robertson et al., 1974; Robertson, 1976). Researchers chose a community with a dual cable system and via split cable showed PSAs on safety belt use to households with cable A and assigned households with cable B as the control group. Observers were hired to count and record automobile drivers who buckled up on roads, and their license plate numbers were matched with owners' addresses and traced back to their respective experimental and control portions of this cable system. Although different types of PSAs were deliberately produced to target at distinct audiences, no

of PSAs were deliberately produced to target at distinct audiences, no significant behavioral changes were found. Moreover, because no direct interviews were conducted to obtain in-depth information about the audience, few alternative explanations were available to interpret why this safety belt campaign failed. The study of the use of safety belts suggests that merely manipulating the audience's exposure to PSA information is not sufficient to produce desired behavioral change.

As Hyman and Sheatsley (1947) said, even if all the physical barriers to communication were known and removed, psychological barriers such as people's interest and ability to comprehend messages remain to impede the information flow. Despite the fact that researchers could control the audience's reception of PSA messages, factors such as levels of involvement, attention to messages and demographic attributes have to be taken into consideration to evaluate the success of the information campaign.

PSA messages also have been found ineffective when researchers expected significant changes in "deep-rooted" behavioral patterns relevant to health-related issues (O'Keefe, 1971; Schmeling & Wotring, 1976, 1980). In Schmeling and Wotring's study, an agenda-setting design was employed in an attempt to demonstrate PSA effects. The hypothesis that frequent TV viewing of drug-specific spots contributed to increases in people's perceived salience of the drug abuse issue, however, was not supported. In O'Keefe's study on effects of anti-smoking commercials, PSAs were viewed as "reminders" instead of "motivators", and they appeared to be more effective among non-smokers than smokers.

In spite of some disappointing results, successful information campaigns incorporating various communication strategies have still been reported. By

considering "mental retardation" as an issue for which people might lack of inherent predispositions, researchers conducted a six-month information campaign that significantly increased people's knowledge and improved their attitudes toward mental retardation (Douglas, Westley & Chaffee, 1970). Results of the campaign evaluation suggested that media-borne messages including large quantities of print ads were the primary reasons for the impressive achievement.

Described by O'Keefe and Reid-Nash (1986) as "an exemplary state-of-the-art program", the Stanford heart disease prevention campaign successfully increased people's knowledge in heart disease prevention and modified people's behaviors in the experimental communities (Maccoby, Farquhar, Wood & etc., 1977, 1981). Various types of promotional materials, including television and radio PSAs supplemented by face-to-face instruction programs to high-risk subjects, contributed to the project's success.

Another report on a successful campaign comes from O'Keefe's study on "Take A Bite Out of Crime" (1985). The information campaign was designed for crime prevention and PSAs were the most publicized aspect of it. O'Keefe essentially focused on PSA impacts and found that exposure to them was significantly related to increases in most of the preventive activities suggested in the PSAs. However, O'Keefe noted that patterns of his findings followed the "classic reinforcement process" rather than conversion.

Public service spots were found to be influential in creating people's awareness of community mental health resources but not in influencing attitudes relevant to solutions of mental health problems (Schanie & Sundel, 1978). Similar results were also found in an advertising campaign aimed at family planning in that people who held a favorable attitude toward avoiding unwanted pregnancies did not necessarily increase contraceptive use (Udry, Clark, Chase &

etc., 1972). In a study of smoking cessation in which cigarette consumption was employed as the index of anti-smoking campaign effectiveness, Warner (1977) confirmed smokers' behavioral changes, although such a non-reactive measure hardly allows an in-depth audience analysis.

PSA effects were also studied in experimental settings. Lynn (1973) conducted an experiment on people's message retention of PSAs and found that older people had lower recall of PSA information than did younger people. To study effects of different appeals on television viewers, Lynn (1974) conducted another experiment. Four message types: emotional, logical, source-attribute and fear; were perceived as the basis of persuasive appeals and they were expected to predict PSA effects (1). Findings suggested that emotional message appeals seemed to be most preferred by college-student subjects.

Exposure to PSA information is sometimes said to influence people's perception of institutions of public service as a whole. As Paletz, Pearson and Willis suggest (1977), if commercial advertising could be said to reinforce people's dispositions toward capitalism, free enterprise and materialism, then such identical functions could also be applied to the case of PSAs. For instance, PSAs may influence certain feelings and attitudes toward democratic systems, governmental benevolence and charity organizations. Public service advertising should be considered as one way of affecting audiences' values and attitudes toward institutions of public service, and consequently contributing to the stability of the political system.

To measure people's perceptions of PSAs suggested by Paletz et al. and probe media impacts on people's PSA attention, O'Keefe, Mendelsohn and Liu (1980) conducted a study in which he hypothesized that individuals who were more attentive to PSAs had greater trust in government than others who weren't, and

they would also feel less alienated from society. However, the results showed little support to Paletz et al's theoretical assumption.

Mixed results from previous studies suggest that PSA impact may differ from one information campaign to another, depending on the issue itself, intensity of media intervention, characteristics of target audiences, campaign objectives and the evaluation methods used. With so many possible determinants of impact, it may be more rewarding for us to pay attention to "what people learn from communication activity" rather than to people's attitude or behavioral changes. We believe that careful assessments of media influences on audiences will be useful for advertising and public relations practitioners to plan and implement information campaigns.

II. Theory and Hypothesis

Studies on Mass Media Use and Knowledge Gain

The linkage between mass media use and knowledge gain in political and economic affairs has been studied extensively (Tan, 1976; M. Robinson, 1976; Atkin, Galloway & Nayman, 1976; Clark & Fredin, 1978; Palmgreen, 1979; Becker & Whitney, 1980; McLeod & McDonald, 1985; McLeod & Kosicki, 1986; Chaffee & Schleuder, 1986; J. Robinson, 1986; McLeod, Pan Rucinski, 1988), but few studies have focused on mass media use and its impact on people's learning from PSAs. This is perhaps due to the intermittent presentation of PSAs in non-prime time slots (Hanneman & McEwen, 1973). Indeed, irregular patterns of disseminating PSAs produce difficulties for researchers seeking PSA effects. Since PSAs were defined previously as "the product of public concern" (O'Keefe et al., 1980, O'Keefe, 1986), we might speculate how much people learn from PSAs could be

predicted by how much they are concerned about public issues. Attention to news of public affairs, in this case, could be seen as one variable underlying people's interest in public affairs. However, other might argue for greater exposure to other types of media content (e.g., entertainment programs or advertisements) results in increased attention to PSAs and learning from them.

Therefore, we need to study the association between media use and PSA learning in a more systematic manner. One theoretical argument concerning media use and learning comes from researchers' questioning of the use of exposure to mass media as a predictor of people's knowledge retention. McLeod and McDonald studied the relationship between media orientations and their influences on economic knowledge and political participation, and concluded that "there is more to media impact than simple exposure." (McLeod and McDonald, 1985) A panel study conducted by Chaffee and Schleuder (1986) focused on the formation of reliable indices of attention to media news. They attributed weak relationships between exposure to television content and knowledge of public affairs to the oversimplified measurement of media exposure, which understated the case of television effects. Other studies have shown that self-reported measures of exposure and attention to mass media can be theoretically and empirically separable (McLeod and Kosicki, 1986; McLeod, Pan & Rucinski, 1988).

A second theoretical argument is the influence of different media on people's acquisition of knowledge. Although repeated evidences show that exposure to media, especially reliance on newspaper predicts people's acquisition of political knowledge, the predictive power of media on the increase in PSA knowledge remains uncertain. It's unclear which type of media, print or electronic, will better predict learning of PSAs (2).

A third theoretical argument is that people's attention to public affairs

presented by mass media, instead of other media content, is more likely to contribute to the increase in learning (McLeod et al., 1985, 1986 & 1988; Chaffee et al., 1986). Since a PSA is produced presumably for "public interest", and attention to public affairs may be a function of interest in public issues, we may infer that attention to public affairs reported by media is a better predictor to PSA learning compared with attention to other types of media content (3).

The Distinction between Awareness and Comprehension

Some media researchers (Robinson & Levy, 1986) noted that the measurement of knowledge gain should go beyond simple recall because of the unreliability of recall measurement. That is, people with good memory always recall better than do forgetful people. Robinson and Davis accused most communication researchers of failing to "discriminate between recall and understanding" of news information. They said:

> Even a person who paid close attention to and understood most of the information in a newscast might be able to come up with only one or two stories when ask point-blank to recall them. Conversely, remembering individual details from a story doesn't constitute evidence that the individual understood what the story was about (pp. 109).

Based on Robinson and Davis's argument, simple recall can not be seen as a reliable indicator of the acquisition of knowledge or learning from media content. It appears to be reasonable to construct a new variable, comprehension to the media content, as the indicator of learning. Applying to the case of PSA learning, we surmise that the repeated exposure to specific media content (public affairs) would help people to be aware of PSA messages, while more attention to the content of public affairs would enable people to be concerned about public issues and comprehend PSA messages better.

World View and Mass Media Use

"World view" refers to "basic assumptions and images that provide a more or less coherent, though not necessarily accurate, way of thinking about the world." (Kearney, 1984: p.41). The general concept of world view was used as a surrogate for the cultural factors which influence people's news images and political knowledge (McLeod, Amor and Kosicki, 1987). McLeod et al. developed four distinct dimensions of world view: Existential Pessimism, Quiet Fatalism, Knowable World and Confidence in Science, and investigated their associations with media images. Results showed that Fatalism (negative) and Knowable World (positive) influenced people's knowledge acquisition of public affairs if people thought that media news provided a meaningful pattern to them. Among several possible dimensions of world view (i.e., Fatalism, Optimism and Knowable World) (4), Fatalism is probably the concept having the most in common with variables used frequently by public relations researchers examining media effects. Grunig (1978 & 1984) has proposed a model in which he used two main guiding variables, problem recognition and constraint recognition, to identify publics in public relations research (5). The fatalistic public was defined as the group with low problem and high constraint recognition, who "made no effort to plan a behavior for that issue". The fatalistic group is rather inactive and less likely to process available information and less willing to involve themselves in community activities. One important implication from the Grunig's model is that people with different characteristics use mass media differently for different purposes. Therefore we can hypothesize the negative association between Fatalism and attention to public affairs, for recognizing fatalistic people will be less likely to pay attention to public affairs compared with non-fatalistic people.

Regarding world view as the antecedent to media use, that is, we may

speculate that world view has indirect effect on PSA learning via media variables. In addition, there might be some joint effect of media variables and world view on PSA learning. To be more specific, we pose the theoretical assumptions that Fatalism and media variables, especially attention to public affairs, will have negative interaction effect on PSA learning, while Knowable World and attention to public affairs produce positive interaction effect on PSA learning. Theses assumptions, however, are relatively new and exploratory, and they need to be tested by empirical analyses later.

Based on the theoretical assumptions provided, research hypotheses are as follows:

H1 The greater the exposure to television public affairs, the greater the awareness of PSA content.

H2 The greater the attention to television public affairs, the greater the comprehension of PSAs.

H3 Among the three types of television content, news, entertainment programs and advertisements, attention to public affairs is most highly correlated with people's comprehension of PSAs.

H4 The more people believe the world is knowable and predictable, the more they will pay attention to television public affairs.

H5 People with high-fatalistic views are less likely to pay attention to television public affairs than low-fatalistic people.

H6 "knowable world" people will learn more from PSAs than "non-knowable world" people as the attention to television public affairs increases.

H7 Low-fatalistic people learn more from PSAs than high-fatalistic people as the attention to television public affairs increases.

III. Method

Sampling Method

The present study is a secondary analysis of data drawn from a research project studying information processing strategies and their consequent effects on cognition. Telephone interviews were conducted with 480 adults randomly

selected from residents in Dane County, Wisconsin, October, 1987. The sampling procedures involve a variant of standard added digit dialling methods to ensure access to unlisted numbers (Groves & Kahn, 1979; Sudman, 1983) (6). Interviewers were trained seniors and graduate students enrolled in a research methods course. Interviewers were told specific call back rules before starting formal interviews to retain equal probability of selection. All questionnaires were verified by professional interviewers from Wisconsin Survey Research Lab. Comparing with 1980 census data in Dane County, the sample is slightly older and more-educated (Table 1).

Measurement

Demographics. Typical demographic information was obtained: sex, age, income, occupation and education. Age is measured by asking what were the respondents' ages on their last birthday. Education is measured by asking what the highest year of school they had completed. Household income is categorized by $10,000 intervals. Occupation was coded according to Duncan's SEI scores (7).

Memory Factor. recall of advertisement slogan is the control variable used to prevent possible contamination of memory factors in effects of people's learning from PSAs. Commercial slogans were provided to respondents and they were asked to name products and brands corresponding to those slogans.

Mass Media Use. The number of days spent watching television during a week were multiplied by hours of watching television on the average weekday evening to measure frequencies of television viewing. Frequency of exposure to morning news programs, national news at 5:30, local news, news magazines were combined to measure exposure to television public affairs, whereas frequency of exposure to situation comedies and crime/adventures were combined as an index of exposure to

television entertainment Programs. Cronbach's alpha used to assess the reliability of each of the three distinct media dimensions. Items measuring television exposure to public affairs and entertainment programs showed relatively high degree of homogeneity (.98 and .53 respectively, see Table 3).

The degrees of attention (ten-point scale) to international affairs, and national government and politics, local government and politics were combined into an index to measure attention to television public affairs. The same scale was applied in the measurement of attention to television advertisements by combining the degrees of attention paid to different commercials. Attention to crime/adventures and situation comedies were combined to measure attention to entertainment programs. Items within each dimension for these attention measures appeared to have high degree of homogeneity. Cronbach's alphas are .76, .84, .64 to the index of attention to ads, public affairs and entertainment programs respectively (Table 3).

World View. Five-point Likert scale items were used to measure world view. Respondents were required to respond to these statements concerning the concept of world view on an agreement-disagreement basis. Factor analysis with orthogonal rotation reduced these items to three dimensions: Optimism, Fatalism and Knowable World (Table 4).

Optimism stands for the belief that life becomes better for people, most people lived untroubled lives, and that life treats most people fairly. In addition, two items measuring Optimism were worded negatively in order to avoid the problem of response set. Fatalism represents an apathetic attitude toward things happening outside the community, the feeling of futility in changing one's fate and the belief that things happening in the world don't have causes or purposes. Knowable World represents the positive attitude toward intelligent

planning and the belief that the patterns of events in the world are understandable.

Learning from PSAs. An opened-ended question was used to measure how much people have learned from PSAs. The definition of PSAs was worded as: ".....they (PSAs) attempt to give information or try to promote things that help the viewer or the public more generally. The public service ads are not paid for by commercial sponsors, but are developed by government or private non-profit organizations". By given the definition of PSAs, people are asked to recall as many PSAs as they could and state what PSAs tried to tell people to do. People's awareness of PSAs is the summation of numbers of legitimate PSAs they could recall, whereas people's comprehension of PSAs is indicated by the summative score derived from codings of respondents' correct description about what PSAs tell the audience to do and what specific goals the PSAs have (8).

Analyses

The data analysis procedure involves several statistical steps. First, descriptive statistics including means, standard deviations, and reliability coefficients for variables of mass media are used. Second, factor analysis was employed to examine homogeneity and discriminant power of three dimensions under the concept of world view. Results from principal component analysis with orthogonal and oblique rotations were both obtained. The factor structure derived from orthogonal rotation appeared to fit data better. Therefore, only the orthogonal solution is reported.

Third, Pearson Correlation was used to show the correlation pattern between world view, mass media use and their impacts on PSA awareness and comprehension.

Fourth, the hierarchical regression technique was used to examine different

contribution of each independent variable to the awareness and comprehension of PSAs. Demographic variables were entered as the first block and recall of commercial slogan was entered as the second. Variables in both blocks were identified as control variables. Then world view, television exposure and television attention to different content were entered as the third, fourth, fifth block respectively.

Finally, hierarchical regression equations with interaction terms were used in order to detect the interaction effects between media variables and world view as suggested by hypotheses. Since interaction terms are the products of two independent variables, multicollinearity can emerge to reduce the consistency and efficiency of the regression estimates. Nevertheless, seriousness of multicollinearity can be efficiently alleviated by the method introduced by Smith and Sasaki (1979) (9)

IV. Results

The first hypothesis states that exposure to television public affairs is positively correlated with the increase in people's awareness of PSA content. Table 5 shows that exposure to television public affairs is uncorrelated with awareness of PSAs, the hierarchical regression equation (Table 6) with other variables controlled for shows no significant relationship between exposure to television public affairs and awareness of PSAs. Hypothesis 1 is not supported.

Concerning the relationship between attention to public affairs and PSA comprehension, Table 5 shows that attention to television public affairs is correlated with PSA awareness ($r = .22$, $p < .01$) and comprehension ($r = .14$, $p < .01$). The regression analysis indicates that attention to public affairs contributes significantly to awareness (Beta= .15, $p < .01$) and comprehension

(Beta= .10, p< .10). The evidence supports hypothesis 2.

Comparing across three different types of TV content in terms of their predictive power to PSA comprehension, we found that attention to public affairs is significantly correlated with awareness and comprehension (Table 6). Other media predictors, attention to commercials and attention to entertainment programs, do not contribute significantly to the variation of comprehension. Therefore, hypothesis 3 is supported.

The relationship posited between "knowable world" people and attention to TV public affairs is tested by using regression analysis in which demographic variables are entered first as the control block then world view variables as the second block (Table 8). People who believe that the world is understandable are found to pay more attention to public affairs (Beta= .16, p< .01). The results supports hypothesis 4.

Turning to the hypothesis of the negative relationship between Fatalism and attention to TV public affairs, we found that fatalistic people appear to be less likely to pay attention to television public affairs (in Table 8, Beta=- .15, p< .01) but more likely to pay attention to entertainment programs (Beta= .14, p< .01) and commercials (Beta= .12, p< .01) when controlling for other variables. The evidence confirm hypothesis 5.

The last task is to explore the possible interaction effects between world view and media variables when they are used as predictors to people's learning from PSAs. We begin by testing the hypothesis of positive interaction between knowable world and attention to public affairs. In Table 9, the regression equation with the interaction term shows that the interaction effect doesn't play a role in affecting learning. Hypothesis 6 is not supported. Then we test the hypothesis of negative interaction between Fatalism and attention to public

affairs. Table 10 shows a significant relation at .10 level between the interaction term and PSA learning in a positive direction. Such positive relationship is in conflict with the hypothesis stating that the interaction terms should be negatively correlated with PSA learning.

To probe the details of the interaction effect, crosstabulation of PSA recall by attention to public affairs on television controlling for Fatalism was used. Table 11 shows that people who score medium on Fatalism tend to learn more from PSAs as attention to public affairs increases, although such relationship is significant at a .08 level (10). No significant effect was found in high or low fatalistic groups. The result suggests the positive interaction effect on PSA recall between Fatalism and attention television public affairs, which is not consistent with hypothesis 7.

V. Discussion

The degree to which people could recall and comprehend PSAs seem to be strongly affected by age and memory factor. That is, highest recall levels come from younger people with high ability to recall commercial information, people who are the less optimistic, and those with high attention to television public affairs. While younger people with high ability to recall commercial information, and those who have a view of knowable world appear to comprehend PSAs better. Results of age influences on PSA recall are consistent with results of Lynn's study (1973). Media variables used here don't play a decisive role in the understanding of PSAs, although attention to television public affairs does predict PSA recall.

Although many communication researchers advocate the distinction between simple recall and comprehension especially when they are indicators of mass media

effects, results from the present study don't support such conceptual difference. In the present study, almost the same independent variables predict PSA recall and comprehension, and a relatively high correlation between PSA recall and comprehension (.78) indicates the empirical overlap. It appears that "recall" is necessary but not sufficient for "comprehension".

People who believe the world is knowable and hold relatively low fatalistic views are likely to pay more attention to television public affairs. This result supports Grunig's assertion that a fatalistic group is less likely to seek information as solutions to different problems.

Knowable World and attention to television public affairs appear here to contribute independently to PSA learning since no interaction effects were found. Fatalism appears to interact positively with attention to television public affairs. That is, as people's attention to public affairs increases, those who hold rather neutral attitudes toward Fatalism are likelier than high and low fatalistic groups to learn PSAs well.

The strong influence of age on PSA learning leads us suspect that there might be some other variables mediating people's ability to learn things from television. For instance, the information-processing-deficit hypothesis (Craik & Simon, 1980) suggested that elder people will process information at a slower rate than younger people. Since television messages are usually presented in a rather fast paced and condensed format such that they requires more mental efforts in active processing, slow information processors will be less likely to perform well in comprehension. Educational level may also interfere with the relationship between age and comprehension (Cohn, 1966; Winocur, 1981). The less well-educated elderly might be more susceptible to mental inactivity in learning.

The significant relationship between age and PSA learning may also be

attributed to the different levels of interest in advertisements and in public affairs among different age groups. Empirical evidence shows that young people appear to pay more attention to television ads but less attention to television content of public affairs than old people (11). However, some post hoc analyses show that there is no two-way interaction effect between age and attention to different television content on PSA learning (Table 12) (12). Neither did we find significant three-way interaction among age, attention to media content and recall of commercials on PSA recall at .05 level (13). Finally, we may speculate that some issues stressed by PSAs such as anti-drug abuse or anti-smoking are more directly related to youngsters than to older people. Results from the content analysis of responses to the question concerning PSAs shows that AIDS, drug abuse, drunk driving and smoking are the issues cited most frequently by respondents and they appear to be of higher concern to young people (14). However, many more mediators between age and learning from PSAs remain open to future inquiries.

It is clear that Optimism is negatively associated with recall of PSAs, although the notion of Optimism is not included in the research hypotheses for the relationship between Optimism and recall of PSAs has never been investigated before. This negative relationship is perhaps due to the nature of conceptualization of Optimism. McLeod et al.,(1988) used "Polyanna" to label this dimension of world view, and this term conveys a "blind" positivity, meaning optimistic people measured by this factor may be relatively naive and confident about the world without specific reasons for changes, and such innocent attitudes will lead them more likely to emphasize the entertaining value of television content. The positive relationships between Optimism, attention to television ads and entertainment programs support such speculation (Table 8).

Despite all the efforts to locate appropriate predictors of learning from PSAs, it is perhaps surprising that approximately one-third of the respondents couldn't recall or describe details of any PSAs. Although information/learning was cited by most viewers as the most important motive of watching television (Rubin, 1984), people don't seem to retain much information as researchers expected.

Labeled as a "cognitively passive experience" by Gunter (1987), television viewing behavior doesn't appear to efficiently induce learning. The problems may worsen when PSAs are presented sporadically in non-prime time slots, which might explain why people will be likelier to forget or even miscomprehend what they have learned from PSAs on television.

The present study is a secondary analysis confined itself to the methodological constraints in data collection. For the measure of PSA learning, the original study was merely concerned about the comparison between commercial and PSA recalls; therefore, no specific measures are employed to measure comprehension, which might explain our inability to draw a clear distinction between awareness and comprehension.

Some important factors predicting PSA recall are also overlooked in the primary study such as types of appeals of PSAs presented (Lynn, 1974), informational needs, interest levels and degrees of involvement. Risk perception could probably induce people's motivation to learn something from PSAs if they represent health-related issues (Beck & Lund, 1981; Weinstein, 1984; O'Keefe, 1985).

A methodological problem also arises when recall is used as a vital measure of the acquisition of knowledge during survey. Sometimes people may be unable to retrieve stored information immediately without being provided by cues (Bradburn,

Rips & Shevell, 1987). In addition, using open-ended questions in the telephone interview may result in less elaboration of responses compared with face-to-face interviews (Groves, 1978). To some extent experiments might help subjects to recall more information than they do in a natural condition. However, researchers may need to weigh pros and cons before they determine what method will be appropriate.

Roles of mass media on attitude and behavioral changes were evaluated pessimistically during the fifties and sixties and more cautious attitudes toward media effects were adopted by mass communicators in the eighties. Because the conclusions of null effects were stressed by early researchers, a new look with emphasizing the cognitive effects such as learning and information retention instead of belief or behavioral changes appears to be more pragmatic. The present study aimed at PSA learning, too, adopts a conservative approach in evaluating effects of PSAs. However, results show a wide ignorance of PSAs by nearly one-third of the respondents and exposure to television content is ineffective in predicting learning. People's concerns for public issues, indicated by attention to television public affairs, significantly increase people's awareness of PSAs. Defined as individual cognitive difference, world view could also indirectly affect learning via television viewing behaviors. Nevertheless, issues such as how to build more reliable and valid measures of world view, and what dimensions of world view have not been explored, remain open to researchers.

Researchers who are interested in studies of PSAs are encouraged to construct more reliable measures of comprehension if knowledge gain is considered as one of the goals. Also, the effect of memory must be taken into serious considerations especially when the survey method is used. Also, some important

predictors of PSA learning need to be included in future studies. They are, informational needs and interest levels suggested by Gunter, the perceived threat (risk perception) and personal involvement (Beck & Lund, 1981).

For campaign planners, we encourage them to produce fine quality of PSAs to increase the probability of getting frequent placement. PSAs aimed at specific audiences should be tailored to achieve maximum effects. For instance, PSAs concerning the elderly should be presented at a moderate pace with easy-to-comprehend messages so that older people can learn from them. Finally, campaign planners shouldn't be satisfied merely with producing attractive PSAs; adopting multi-media strategies such as using interpersonal influences, aggressively contacting mass media with news releases and preparing other promotional materials will help them achieve campaign objectives.

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ENDNOTES

(1) Lynn argues that message types, instead of issues promoted by PSAs, were associated with PSA effect (measured by message evaluation).

(2) Because wordings of the questionnaire for the present study only focus on televised PSAs, it is impossible to ascertain effect of print PSAs from the available data.

(3) Wordings of the questionnaire for the present study doesn't include measures for attention to PSA messages specifically. Therefore attention to public affairs is considered the better predictor of PSA learning based on the theoretical assumption.

(4) Confidence in Science dimension of World View was not measured in the present study because it was found to lack discriminant power in the 86' survey conducted by McLeod, Amor and Kosicki. For detail please see McLeod et al., "Images of the media, orientation to the world: where do public images of mass media news come from?" Paper presented to the Mass Communication Division, International Communication Association, Montreal, Canada, May, 1987.

(5) According to Grunig, publics with four distinct behaviors were identified by different degrees of problem recognition and constraint recognition. They are, the public with problem-facing behavior (high problem recognition, low constraints), the public with constrained behavior (high problem-recognition, high constraint), the public with routine behavior (low problem-recognition, low constraint) and the public with fatalistic behavior (low problem-recognition, high constraint).

(6) The standard added digit dialing method involves two steps. First, we obtain a list of phone numbers systematically selected from the directory (with a random starting point). Second, we add or subtract a constant from the last digit of each phone number and therefore create another set of phone numbers. The original numbers selected from the directory together with numbers added or subtracted by a constant constitute our sample.

(7) SEI refers to Socio-Economic Index.

(8) The score ranges from 0 to 2 for the codings to PSA recall (at most two PSAs can be recalled by respondents), and the score ranges from 0 to 4 for the codings of PSA comprehension, indicated by the correct description of PSAs and what goals these PSAs might have.

(9) The principle of the technique proposed by Smith and Sasaki to reduce the problem of multicollinearity is to rescale two variables X and Y such that the variance of X and Y is not associated with the variance of the interaction term X*Y.

(10) The way to dichotomize or trichotomize variables is to arrange values of variables in the numerical order and use percentiles to locate cutting points.

(11) Results from the regression analysis show that older people are less likely

to pay attention to television ads than younger people (Beta=- .12, p< .05).

(12) As Table 12 shows, education interacts with attention to TV commercials on PSA recall (Beta= .12, p< .01) and on PSA comprehension (Beta= .10, p< .05). It appears that education, instead of age, is more likely to have interaction effect with media variables when PSA learning is the dependent variable.

(13) We do find, however, that there is a three-way interaction among education, attention to advertisement and commercial recall on PSA recall (Beta= .10, p< .10) and on PSA comprehension (Beta= .15, p< .05).

(14) The content analysis involved seventy cases of the total sample.

Table 1

The Comparison between Sample and Census Data
Descriptive Statistics
(n=480)

Demographics

Variables		Sample Statistics(1)	Census Statistics(2)
GENDER	Male	47.9%	48.4%
	Female	52.1	51.6
AGE	Under 30	30.4%	36.3%
	30-44	39.2	29.3
	45-60	18.0	22.5
	Over 60	12.4	11.2
	Mean	39.7 (yrs)	n.a.
	Median	36.0	27.6 (yrs)
INCOME	Below $10,000	20.6%	24.5%
	Below $20,000	38.1	54.4
	Above $50,000	23.3	4.6
	Mean	$30,000 to $40,000	$21,288
	Median	$30,000	$18,309
EDUCATION	High School & over	93.5%	84.9%
	College & over	44.7	26.1
	Mean	14.8	n.a.
	Median	15.0	12.8
WORKING STATUS	Employed	65.6%	68.9%
	Students	13.1	16.0
RELIGION (Top 3)	Roman Catholic	25.2%	n.a.
	Lutheran	24.4	n.a.
	No Preference	12.5	n.a.

Note:

1. Because none of the missing values for each variable exceed 5% of total sample size, they are replaced by means.

2. Census data were obtained in 1980, Dane County.

Table 2

Descriptive Statistics: Media Variables

	Mean	S. D.	Range
TV Exposure			
Days Per Wk Watching TV	5.8	1.9	0-7
Minutes of TV Watching Per Day	128.5	83.6	0-480
TV Public Affair Exposure			
Exposure to TV Morning News	2.2	1.5	1-5
Exposure to TV Natl News	3.3	1.4	1-5
Exposure to TV Local News	3.9	1.2	1-5
Exposure to TV Magazines	2.7	1.1	1-5
TV Entertainment			
Exposure to TV Comedies	2.8	1.0	1-5
Exposure to TV Crime Shows	2.5	1.0	1-5
TV Public Affair Attention			
Attention to TV Intl Affairs	6.5	2.8	0-10
Attention to TV Natl Affairs	6.2	2.7	0-10
Attention to TV Local News	5.7	2.4	0-10
TV Advertisement			
Attention to TV Food Ads	3.1	2.4	0-10
Attention to TV Clothing Ads	3.1	2.3	0-10
Attention to TV Electronic Ads	2.9	2.3	0-10
TV Entertainment			
Attention to TV Crime Shows	4.3	2.5	0-10
Attention to TV Comedies	4.5	2.5	0-10

n=480

Table 3

Descriptive Statistics: Indices of Media Variables and Reliability Analysis

	Mean	S. D.	Range	Cronbach Alpha
Exposure				
TV Viewing Frequencies	819.3	605.6	0-2940	--
TV Exposure to Public Affairs	12.0	3.6	4-20	.98
TV Exposure to Entertainment	5.3	1.7	2-10	.53
Attention				
TV Attention to Ads	9.1	5.7	0-30	.76
TV Attention to Public Affairs	18.5	6.9	0-30	.84
TV Attention to Entertainment	8.8	4.3	0-20	.64

n=480

Table 4

Factor Analysis of World View
(Principal Components with Varimax Rotation)

Variables	FACTOR I Optimism	FACTOR II Fatalism	FACTOR III Knowable World
People live untroubled lives	.55		
Life treats most people fairly	.70		
Life is painful and dangerous	-.72		
People do not get an equal chance	-.75		
No impact on this community		.75	
Many things have no cause		.65	
What will be will be		.51	
Intelligent planning makes difference			.79
Things understandable			.63
Eigen Value	2.3	1.5	1.1
Percentage of Variance	22.6	15.3	11.2

n=480

Note: Item A "Life is better for most people" was dropped from analysis because it lacked discriminant power.

Table 5

Correlation between Awareness, Comprehension of Public Service Ads and Their Predictors (Pearson Correlation)

	Awareness r	Comprehension r
Demographics		
Age	-.20*	-.20*
Occupation	.19*	.14*
Sex	-.09	-.07*
Education	.23*	.20*
Income	.10*	.07
Memory Factor		
Commercial slogans Recall	.22*	.20*
World View		
Optimism	-.14*	-.08*
Fatalism	-.16*	-.12*
Knowable World	.11*	.13*
TV Exposure		
Ads	-.07	-.09*
Public Affairs	.01	-.03
Entertainment	-.01	.001
TV Attention		
Ads	-.05	-.05
Public Affairs	.22*	.14*
Entertainment	-.02	-.01

Notes:

1. * = $p \leq .05$

2. n=480

Table 6

Predicting Awareness, Comprehension of Public Service Ads
(Hierarchical Regression)

	Awareness		Comprehension	
	Beat	R2	Beta	R2
Demographics				
Age	-.18*		-.17*	
Occupation	.09		.05	
Sex	-.03		.003	
Education	.08		.07	
Income	.01		-.01	
		9.5*		6.3*
Memory Factor				
Commercial slogans Recall	.12*		.12*	
		2.1*		1.8*
World View				
Optimism	-.11*		-.05	
Fatalism	-.05		-.03	
Knowable World	.05		.08	
		2.3*		1.4
TV Exposure				
Ads	-.02		-.05	
Public Affairs	.07		.05	
Entertainment	.02		.03	
		1.0		0.4
TV Attention				
Ads	-.06		-.07	
Public Affairs	.15*		.10	
Entertainment	-.01		-.02	
		1.5		1.0

Notes:

1. * = $p \leq .05$

2. n=480

Table 7

Partial Correlation between Mass Media Use and PSA Learning

	Awareness Part r	Comprehension Part r
Exposure		
TV Exopsure to Ads	-.01	-.05
TV Exopsure to Entertainment	-.01	.01
TV Exopsure to Public Affairs	.06	-.07
Attention		
TV Attention to Ads	-.02	-.02
TV Attention to Entertainment	.01	-.03
TV Attention to Pulbic Affairs	.17*	-.04

Note:

1. * $p \leq .05$

2. n=480

Table 8

Predicting Attention to TV Ads, Public Affairs and Entertainment
(Hierarchical Regression Analysis)

Predictors	TV ADS Beta	TV PA Beta	TV EN Beta
Demographics			
Sex	.10*	.02	.08
Occupation	.003	.00	.01
Age	.13*	.17*	.18*
Income	.01	.15*	.02
Education	.06	.17*	.15*
	R2=2.0*	R2=10.9*	R2=6.0*
World View			
Optimism	.13*	-.06	.15*
Fatalism	.14*	-.15*	.12*
Knowable World	-.003	.16*	.04
	R2=3.0*	R2=4.6*	R2=3.5*

Note:

1. *= $p \leq .05$

2. n=480

Table 9

Predicting People's Learning from PSAs: Attention to Public Affairs, Knowable World, and Interaction Effects

Predictors	Beta	R2
Demographics		
Sex	-.01	
Occupation	.08	
Age	-.23*	
Income	-.002	
Education	.11	
		9.0*
Attention to TV Pub. Affairs	.14*	
		2.0*
World View		
Knowable World	.08	
		0.6
Interaction Effects		
Att. to Pub. Affairs*Knowable World	.01	
		0.0

Note:

1. * $p \leq .05$

2. n=480

Table 10

Predicting People's Learning from PSAs:
Attention to Public Affairs, Fatalism, and Interaction Effects

Predictors	Beta	R2
Demographics		
Sex	-.01	
Occupation	.09	
Age	-.23*	
Income	-.001	
Education	.10	
		8.3*
Attention to TV Pub. Affairs	.15*	
		2.2*
World View		
Fatalism	-.04	
		0.2
Interaction Effects		
Att. to Pub. Affairs*Fatalism	.08	
		0.6

Note:

1. *= $p \leq .05$

2. n=480

3. The true p value of the standardized beta for the interaction term is .09

Table 11
Crosstabulation of PSA Recall by TV Public Affairs Attention
Controlling for Fatalism
(n=480)

A. Lo Fatalism

	TVPAATT Lo	Medium	High	
PSA Recall Low	61% (19)	40% (24)	49% (34)	48% (77)
High	39 (12)	60 (36)	51 (35)	52% (83)
	19% (31)	38% (60)	43% (69)	Total=100% (160)

Chi Square=3.8
Significance= .15

B. Medium Fatalism

	TVPAATT Lo	Medium	High	
PSA Recall Low	66% (37)	60% (30)	45% (22)	57% (89)
High	34 (19)	40 (20)	55 (27)	43% (66)
	36% (56)	32% (50)	32% (49)	Total=100% (155)

Chi Square=5.0
Significance= .08

C. High Fatalism

	TVPAATT Lo	Medium	High	
PSA Recall Low	67% (44)	55% (36)	56% (19)	60% (99)
High	33 (22)	45 (29)	44 (15)	40% (66)
	40% (66)	39% (65)	21% (34)	Total=100% (165)

Chi Square=2.0
Significance= .36

Table 12

Effects of Interactions on PSA Learning
(Hierarchical Regression)

	Recall		Comprehension	
	Beta	R2	Beta	R2
Demographics				
Occupation	.08		.04	
Sex (Female)	.00		.02	
Age	-.19***		-.20***	
Income	.02		.00	
Education	.10*		.12**	
		9.5***		8.2***
Ad Slogan Recall	.13***		.14***	
		2.1***		1.9**
Attention				
TV PA Attention	.19***		.13***	
TV AD Attention	-.08*		-.08*	
		3.2***		1.6**
First-order Interaction				
Ed*PA Attention	-.04		-.01	
ED*Ad Attention	.12***		.10**	
Age*PA Attention	-.01		-.03	
Age*Ad Attnetion	.07		.06	
		1.5*		1.1
Second-order Interaction				
Ed*PAAT*Ad Recall	-.01		.01	
Ed*AdAT*Ad Recall	.10*		.15**	
Age*PAAT*Ad Recall	.01		.03	
Age*AdAT*Ad Recall	.10*		.07	
		.89		1.3

Note:
* $p \leq .10$
** $p \leq .05$
*** $p \leq .01$